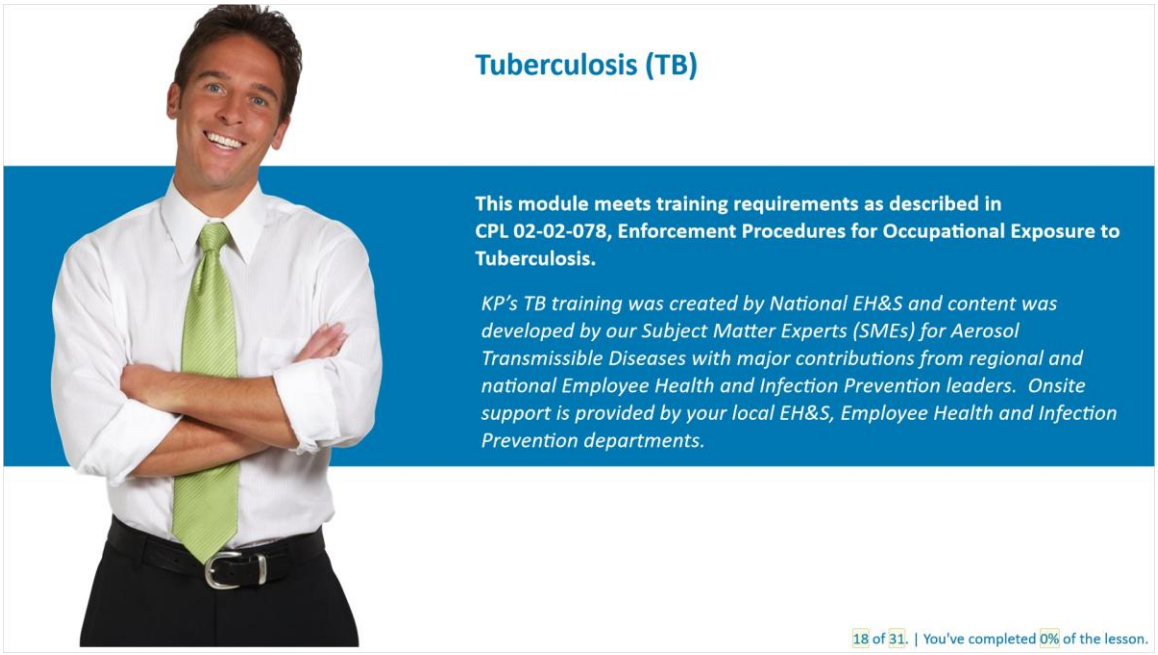
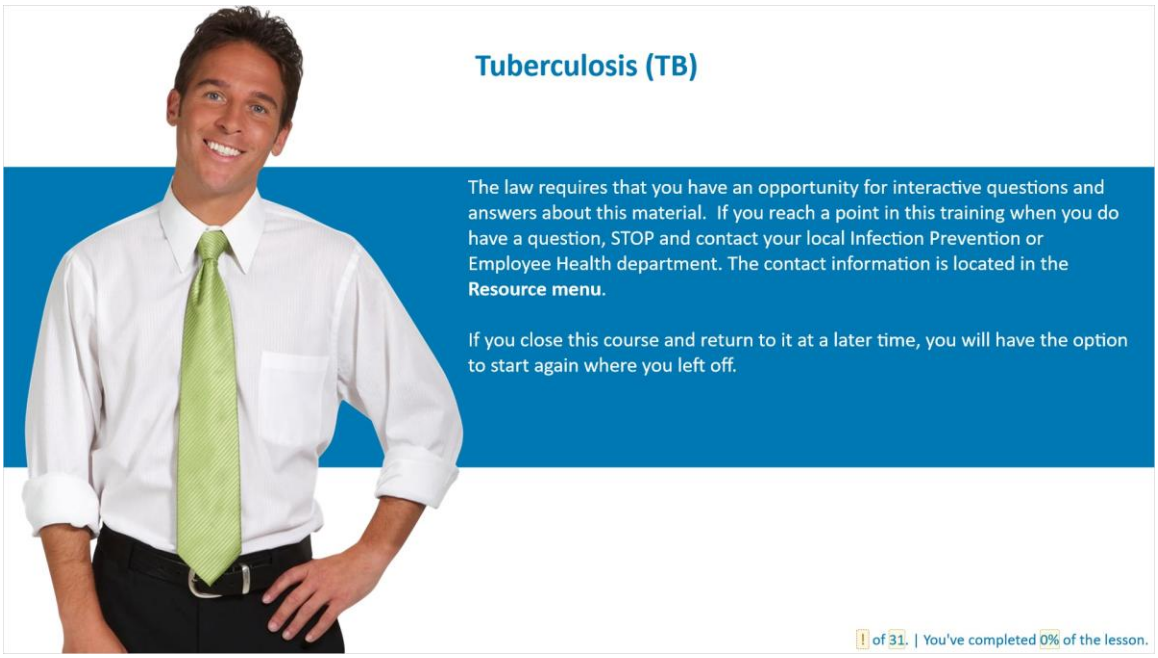
2. TB

2.1 Tuberculosis (TB)



2.2 Tuberculosis (TB)



2.3 What is TB

What is Tuberculosis (TB)?

TB is a **contagious airborne disease** caused by the organism known as Mycobacterium tuberculosis. TB can infect any part of the body, but **the lungs are the most common site of infection**. TB lymphadenitis is the most common form of extrapulmonary TB. Pulmonary and laryngeal tuberculosis are the most contagious forms of the disease.

About 10% of infected persons (i.e., having Latent TB) will develop TB disease (Active TB) at some time in their lives, but the **risk for developing TB disease is considerably higher** for persons who are **immunosuppressed**, especially those with HIV.

Click on each button.

Latent TB | TB Disease (active)

19 of 31. | You've completed 0% of the lesson.

Latent TB (Slide Layer)

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Click on each button.

Latent TB | TB Disease (active)

Latent TB Infection - Persons with latent TB infection do not feel sick and do not have any symptoms. They are **infected with M. tuberculosis, but do not have TB disease**. The only sign of latent TB infection is a positive reaction to the tuberculin skin test or TB blood test (immune compromised persons may have false negative test results). Persons with latent TB infection are **not** infectious and cannot spread TB infection to others.

19 of 31. | You've completed 0% of the lesson.

TB Disease (Slide Layer)

What is Tuberculosis (TB)?

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Click on each button.

Latent TB | TB Disease (active)

TB Disease (Active TB) - TB bacteria overcome the defenses of the immune system and begin to multiply, resulting in the progression from latent TB infection to **TB disease**. People with TB disease (Active TB) have symptoms, are sick, and may be infectious if they have the disease in their lungs or larynx. Some people develop TB disease soon after infection, while others develop it later when their immune system becomes weak.

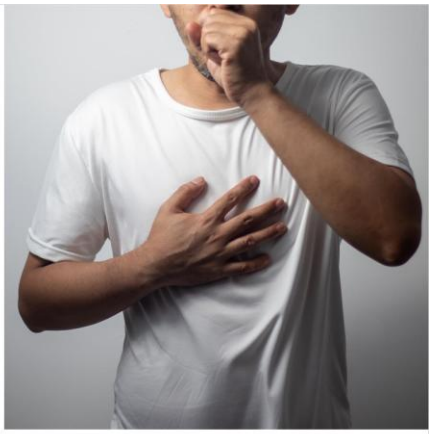
19 of 31. | You've completed 0% of the lesson.

2.4 High Risk

High-risk groups can be divided into two categories

Click on each button.

Exposure to or infection with TB | Developing TB disease (active TB) after infection



20 of 31. | You've completed 0% of the lesson.

Infection (Slide Layer)

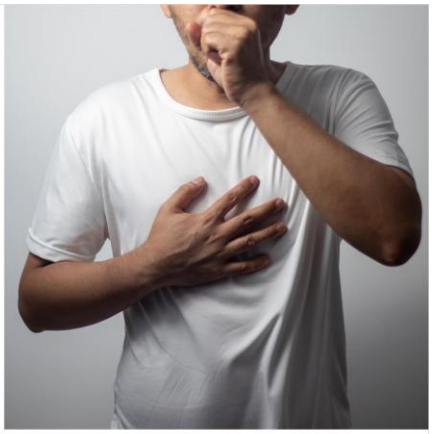
High-risk groups can be divided into two categories

Click on each button.

Exposure to or infection with TB | **Developing TB disease (active TB) after infection**

Groups at high risk for exposure, or infection include:

- Persons who have close contact with someone with tuberculosis disease (Active TB)
- Persons born in areas of the world where TB is common, including some countries is in Asia, Africa and Latin America
- Persons who visit areas with a high prevalence of TB disease
- Persons who abuse drugs or alcohol
- Persons with HIV
- Medically underserved low-income populations
- People who live or work in high-risk congregate settings such as correctional institutions, nursing homes, mental institutions or homeless shelters
- Infants, children and adolescents exposed to adults who are at increased risk for latent TB infection or TB disease
- Locally identified high risk populations
- **Healthcare workers (HCW) who provide services to high-risk groups.**



20 of 31. | You've completed 0% of the lesson.

Developing disease (Slide Layer)

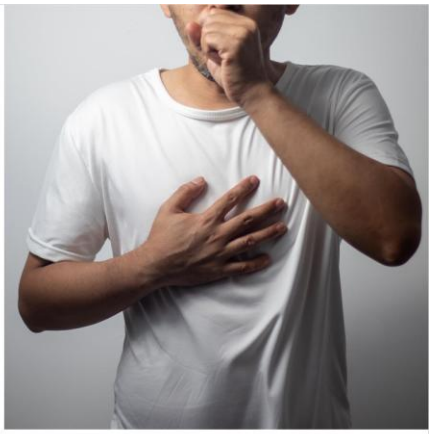
High-risk groups can be divided into two categories

Click on each button.

Exposure to or infection with TB | **Developing TB disease (active TB) after infection**

Groups at High Risk for Developing TB Disease (Active TB) include:

- People living with HIV
- Children younger than 5 years of age
- People infected with M. tuberculosis within the past 2 years
- People with a history of untreated or inadequately treated TB disease
- People who are immunocompromised or receiving immunosuppressive therapy
- People with silicosis, diabetes mellitus, chronic renal failure, leukemia or cancer of the head, neck or lung
- Persons who have had a gastrectomy or jejunoileal bypass
- Persons of low body weight
- Cigarette smokers and persons who abuse drugs or alcohol
- Locally identified high risk populations



20 of 31. | You've completed 0% of the lesson.

2.5 Modes of Transmission

Modes of TB transmission

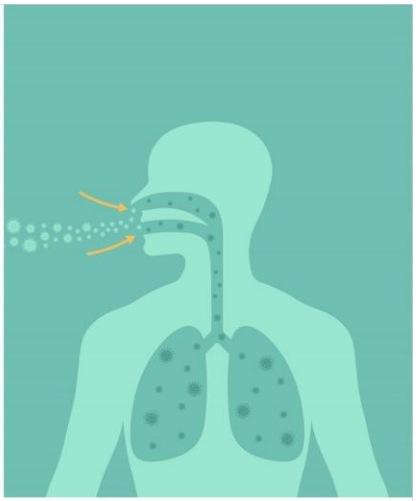
TB is spread from **person to person** by bacteria carried on **tiny particles in the air** (droplet nuclei containing tubercle bacilli). These infectious particles are generated when persons with untreated and active lung or laryngeal TB cough, sneeze, speak or sing. They are so small that normal air currents can keep them airborne for a long time.

Examples of high risk procedures that have higher potential for exposing staff to TB include:

- Endotracheal intubation and suctioning
- Aerosolized administration of drugs, e.g., Pentamidine
- Laryngoscopy and bronchoscopy
- Sputum induction
- Processing of TB specimens
- Cardiopulmonary resuscitation
- Autopsy

Procedures are considered high risk if they may generate significant amounts of aerosolized infectious particles.

TB is NOT transmitted by contact with surfaces or objects!



CDC.gov/tb/education

21 of 31. | You've completed 0% of the lesson.

2.6 Symptoms

Symptoms of TB Disease (Active TB)

The **lungs** are the **most common site of infection**, and pulmonary and laryngeal tuberculosis are the most contagious forms of the disease.

Signs and symptoms:

- A cough that lasts three weeks or longer
- Pain in the chest
- Coughing up blood or mucus
- Unexplained weight loss
- Loss of appetite
- Night sweats
- Fever
- Chills
- Weakness or fatigue

22 of 31. | You've completed 0% of the lesson.

2.7 Prevention - Employee/Physician

Responsibilities for Prevention - Employee/Physician

Follow policies and procedures that have been developed to prevent exposure to tuberculosis.

- Know how to access your Facility's TB Exposure Control Plan. Ask your supervisor or contact Employee Health or the Infection Prevention Department to be directed to this Plan.
- Recognize tasks that include occupational exposure.
- Perform all your tasks according to established work practice control
- Learn to recognize patients with symptoms suggestive of (active TB).
- Report known or suspected TB exposures to the responsible supervisor and to the Infection Prevention or Employee Health designee as soon as possible for appropriate evaluation and follow up.
- Complete your annual TB screening when directed by Infection Prevention/ Employee Health.
- Employees will be screened initially upon hire, annually, or as determined by the TB risk assessment in your region. You will receive this notification from Employee Health (TB testing requirement or questionnaire).

23 of 31. | You've completed 0% of the lesson.

2.8 Prevention - Managers

Responsibilities for Prevention - Managers

- Ensure employees complete medical screening through Employee Health
- Train employees on any site-specific protocols including the purpose and proper use of controls to prevent TB exposure
- If employees are required to use a respirator, ensure employees receive a one-time medical evaluation for respirator use from Employee Health.
- Ensure employees required to use a respirator receive initial and annual training on the specific type of respirator they are assigned to use, e.g., N95, elastomeric or PAPR* *(*Note: Maxair CAPR = type of PAPR)*
- Ensure employees using N95 or other tight-fitting respirators receive initial and annual fit testing
- Know how to access PAPRs for those employees unable to use N95 respirators
- Provide an adequate supply of respirators in the models and sizes that staff have been fit tested for (N95, elastomeric) or otherwise assigned to use (PAPR)

It is the manager's responsibility to assure completion of the healthcare workers' annual TB surveillance by Employee Health Services (TB test request or health questionnaire).

For Employee Health contact information refer to EH&S community link in the **Resources** menu.

24 of 31. | You've completed 0% of the lesson.

2.9 Prevention - Employee Health

Responsibilities for Prevention - Employee Health

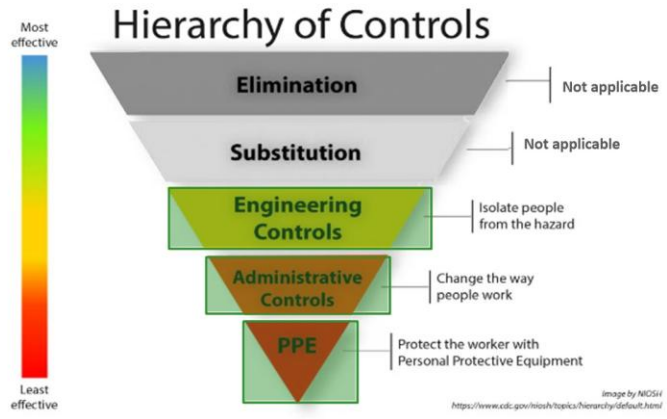
Employee Health Services is responsible for notification of employees **potentially exposed to a patient with TB disease (active TB).** Follow-up should occur 8-10 weeks after exposure.

25 of 31. | You've completed 0% of the lesson.

2.10 Prevention of TB Exposure

Methods to Prevent Exposure

To prevent employee exposure to TB, a 3-step "hierarchy of controls" is recommended by the CDC
Starting with Engineering Controls click through each level for more information.



26 of 31. | You've completed 0% of the lesson.

PPE (Slide Layer)

Personal Protective Equipment (PPE) – Respiratory Protection

Employees should use an N95 respirator, an elastomeric respirator or PAPR in the following situations:

- Entering room of a known or suspected TB patient on airborne isolation precautions, or entering the room after the patient has left but prior to the required clearance time for the room
- Occupying a room when a known or suspected TB patient is undergoing a aerosol-generating medical procedure (e.g., sputum induction, bronchoscopy, surgery, autopsy, etc.)
- Changing air filters serving airborne infection isolation rooms
- Entering an Acid-Fast Bacilli (AFB) Lab

NOTE:

- *When wearing a surgical mask underneath a PAPR, such as in the OR, only the PAPR headcovers recommended by the manufacturer for use with a surgical or face mask underneath may be used.*
- *Surgical masks are NOT respirators*

To correctly use and wear tight-fitting respirators such as an N95 or elastomeric respirator, you must be trained and fit tested for that type of respirator. OSHA requires that employees wearing these respirators have been trained and fit tested ***within the past year****. PAPR users must be trained* ***within the past year****.*

Close

Administrative (Slide Layer)

Administrative Controls

Early Identification and Treatment of TB Cases:

Identify high risk patients as those who have a chronic cough, unexplained weight loss, loss of appetite, night sweats, fever, hemoptysis (coughing up blood), and those who are immunocompromised. Other clues include recent exposure to a person with TB, or country of origin (with high incidence of TB).

Report patients with symptoms suggestive of TB to your supervisor and/or Infection Prevention or Employee Health designee.

Close

Environmental (Slide Layer)

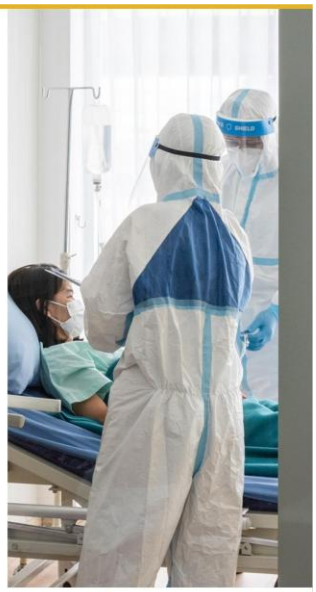
Engineering Controls

Airborne Isolation Precautions:

For markets equipped with airborne infection isolation (AII) negative pressure rooms: If TB is suspected, the patient is placed on Airborne Isolation Precautions and placed in an AII negative pressure room until diagnosis is confirmed or ruled out. Suspected or confirmed TB patients should wear a surgical mask if they are being transported for any reason outside of the AII room.

For markets without inpatient facilities/AII rooms: If TB is suspected, the patient is isolated as soon as possible (e.g., moved out of waiting room into exam room) and/or asked to wear a surgical mask, and promptly referred to a facility equipped to properly test, treat and care for this patient. If patient is placed in a room for isolation, close door and, after patient leaves, keep door closed and restrict entry until required clearance time has elapsed (based on room ventilation rate) or require respirator use to enter.

NOTE: The referring department should always notify the receiving department regarding the suspected TB status of the patient.



Close

2.11 Decomptamination and Dispoal of PPE

Decontamination and Disposal of PPE

Employees must remove any PPE before leaving the work area or when the PPE becomes contaminated and place it in appropriate containers for storage, cleaning, decontamination or disposal.

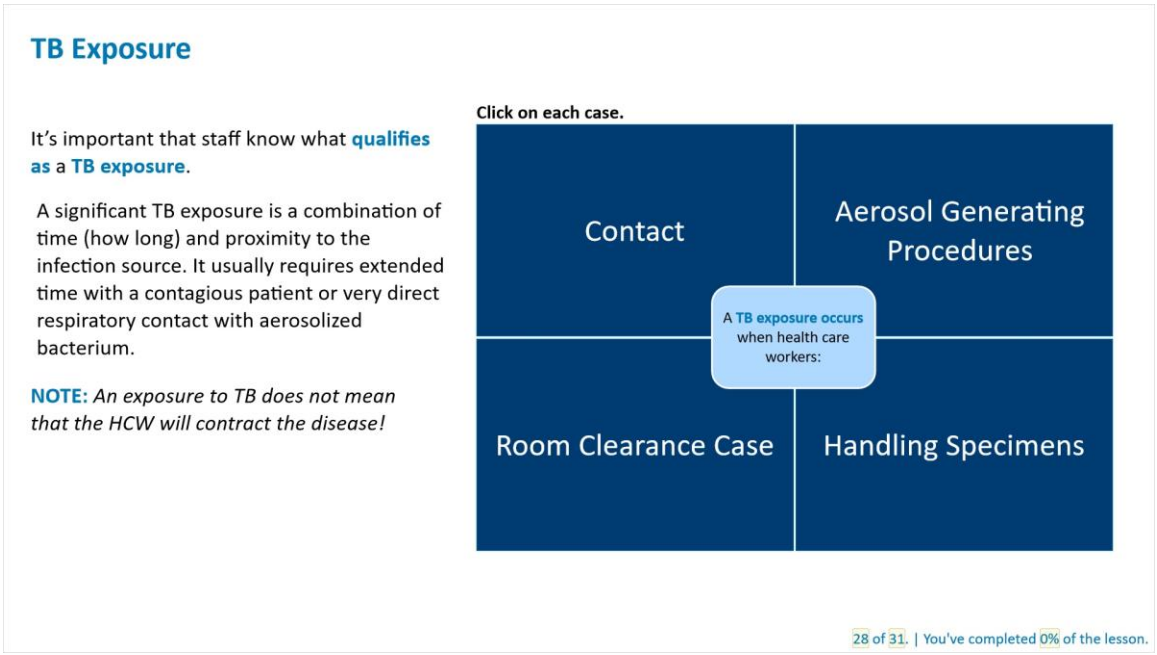
The **exception** is your **respirator (N95, elastomeric or PAPR)**, which must be removed **after leaving the patient room**.

PAPRs or other reusable respirators such as elastomeric respirators must be cleaned and disinfected per manufacturer's instructions. As needed, consult with Infection Prevention to ensure approved products are used.

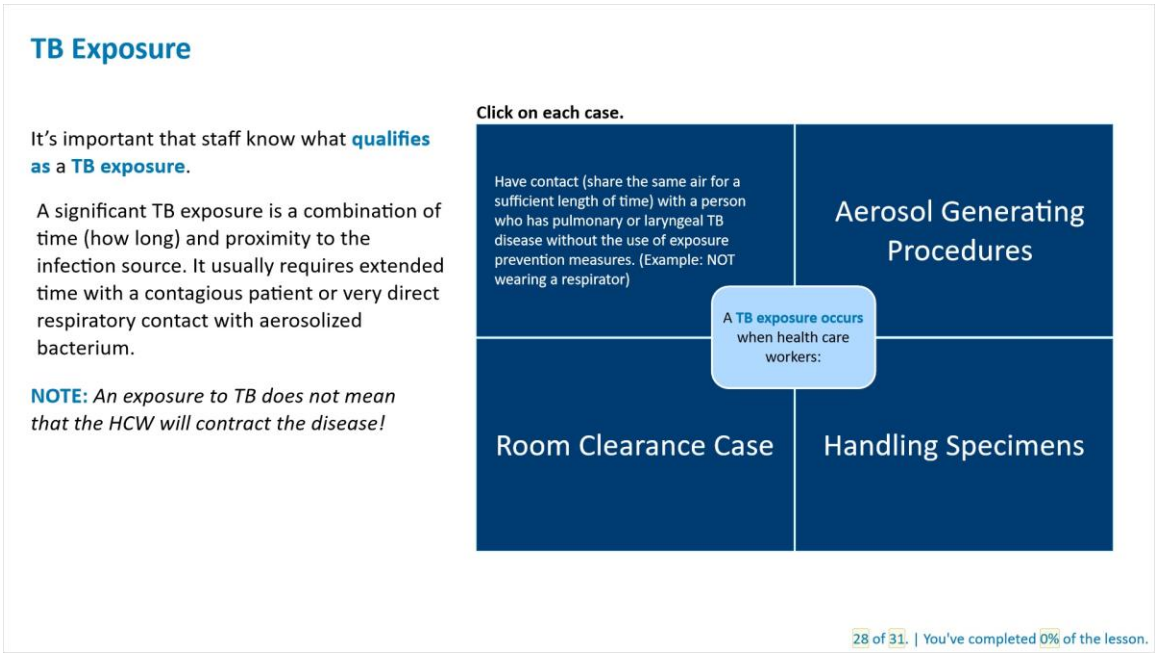
NOTE: *N95s are for single use only unless supplies of stock are extremely low and facility leadership directs staff to implement re-donning of N95s.*

27 of 31. | You've completed 0% of the lesson.

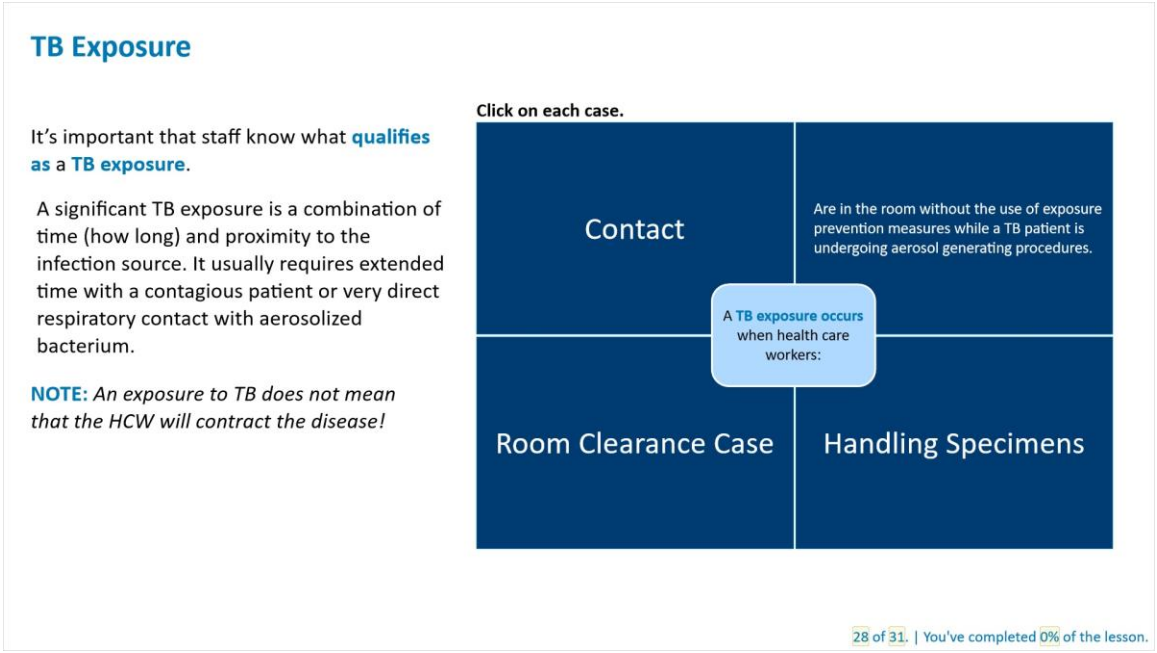
2.12 TB Exposure



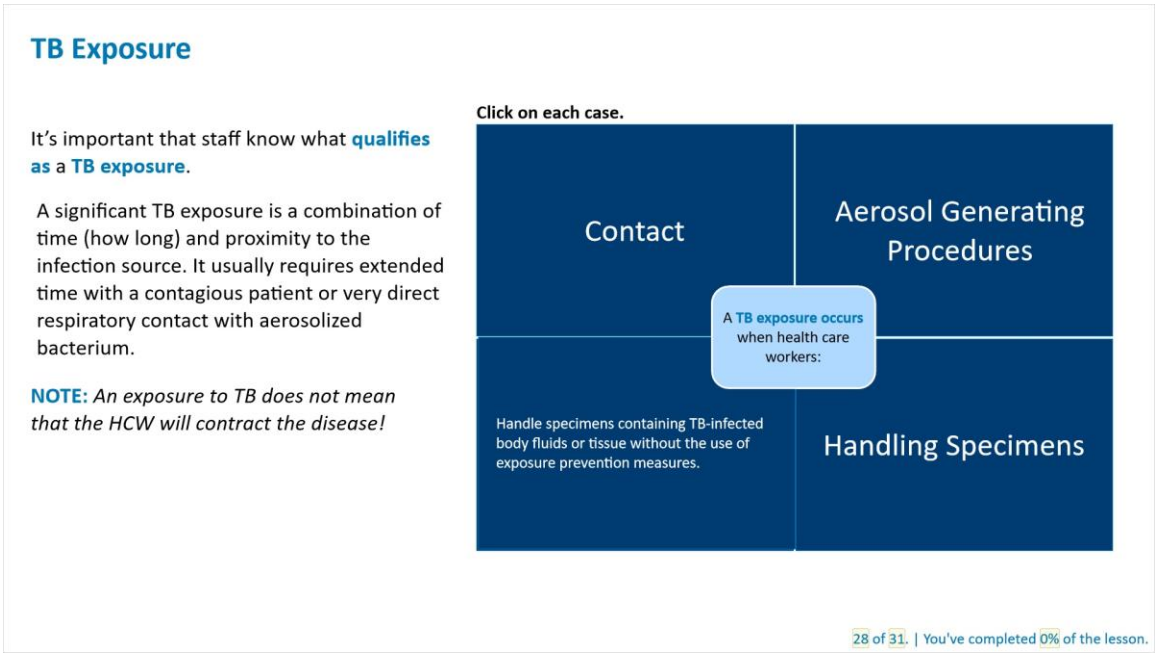
Case 1 (Slide Layer)



Case 2 (Slide Layer)



Case 3 (Slide Layer)



Case 4 (Slide Layer)

TB Exposure

It's important that staff know what **qualifies as** a **TB exposure**.

A significant TB exposure is a combination of time (how long) and proximity to the infection source. It usually requires extended time with a contagious patient or very direct respiratory contact with aerosolized bacterium.

NOTE: *An exposure to TB does not mean that the HCW will contract the disease!*

Click on each case.

Contact	Aerosol Generating Procedures
Room Clearance Case	Enter a room recently occupied by a TB patient prior to air contaminant clearance, and without the use of exposure prevention measures.

A **TB exposure occurs** when health care workers:

28 of 31. | You've completed 0% of the lesson.

2.13 TB Post-Exposure

Post-Exposure Protocol for Active TB

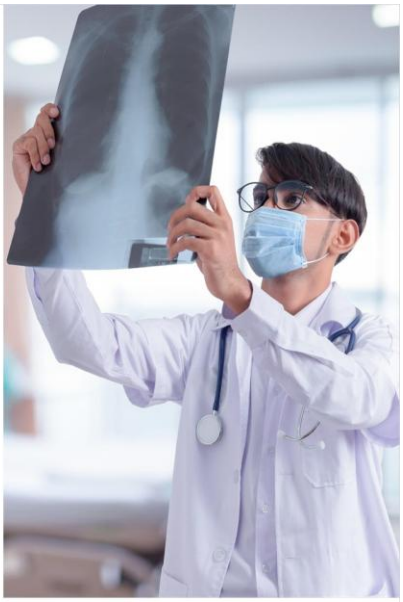
- All TB exposures must be reported to the responsible supervisor and to the Infection Prevention or Employee Health designee as soon as possible for appropriate evaluation and follow up.
- All follow up will be provided free of charge if a TB test (examples: TST - Tuberculin skin test or IGRA - blood test) conversion is determined to be work-related.

29 of 31. | You've completed 0% of the lesson.

2.14 TB Post-Exposure

Preventive Therapy for Latent TB

- Employees with a positive TB test or IGRA, who do not have TB disease (Active TB), will be evaluated for preventive therapy. This evaluation and resulting treatment will be coordinated by Employee Health Services. Employees may be referred to their primary care provider for treatment.
- The purpose of preventive therapy (prophylactic treatment) is to prevent latent TB infections from progressing to TB disease (Active TB).
- Treatment is usually prophylactic use of daily Rifampin for four months, high dose INH/Rifapentine once weekly for three months or INH for 6 - 9 months. Consultation with Infectious Disease physician is advised.
- Participation in a prophylactic treatment plan is voluntary and may be free of charge though the Employee Health Department or the Public Health Department.



! of 31. | You've completed 0% of the lesson.

2.15 TB Disease Diagnosis

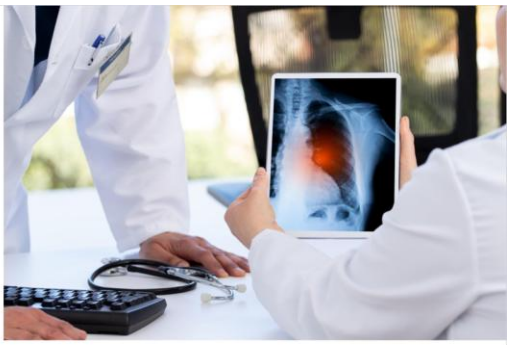
TB Disease Diagnosis

If a health care worker is diagnosed with Active TB:

TB is usually curable if it is diagnosed early and if effective treatment is instituted without delay. Employee Health Services may monitor care to ensure the employee receives appropriate therapy.

Click on each button.

Reporting | Treatment | Return to Work



Confidentiality will be maintained at all times.

30 of 31. | You've completed 0% of the lesson.

Return to Work (Slide Layer)

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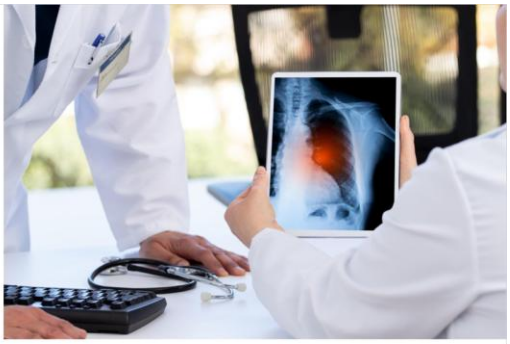

Employees who are diagnosed with TB disease must be cleared by the Department of Health/Public Health Dept. and possibly by an Infectious Disease physician before returning to work.

Confidentiality will be maintained at all times.

30 of 31. | You've completed 0% of the lesson.

Reporting (Slide Layer)

TB Disease Diagnosis

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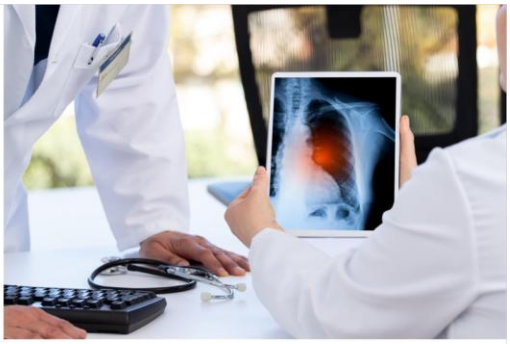

Cases of TB disease (Active TB) are reported to the Department of Health/Public Health Dept. and may involve consultation with an Infectious Disease physician.

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30 of 31. | You've completed 0% of the lesson.

Treatment (Slide Layer)

TB Disease Diagnosis

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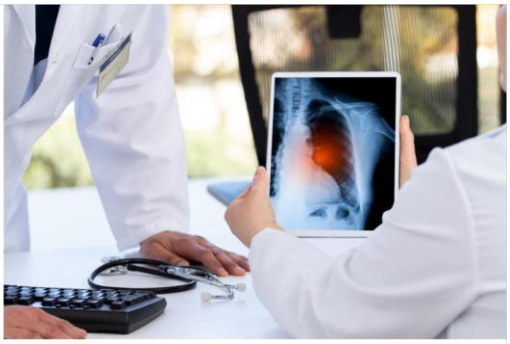
Click on each button.

Reporting | Treatment | Return to Work



TB disease should be treated through directly observed therapy by the Department of Health/Public Health Dept.

- Inadequate treatment can lead to drug resistance

- Sputum is obtained to confirm the diagnosis suspected on chest x-ray. The patient/employee is off work until the sputum is clear of infection.
- An adequate response to therapy is required before a healthcare worker or patient with TB disease is no longer considered infectious.
- Multiple medications are used up to 9 months.

Confidentiality will be maintained at all times.

30 of 31. | You've completed 0% of the lesson.